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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 09/458,322  
Filing Date: December 10, 1999  
Appellant(s): ZACK ET AL.

**MAILED**

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**Technology Center 2600**

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Eamon J. Wall  
Registration No. 39,414  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 10/02/2007 appealing from the Office action mailed March 16, 2003.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

6,886,178 B1	MAO ET AL.	04-2005
6,594,271 B1	WU EL AL.	07-2003
6,185,635 B1	O'LOUGHLIN ET AL.	02-2001

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 32-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mao et al. (US 6,886,178) in view of Wu et al. (US 6,594,271) and further in view of O'Loughlin et al (US 6,185,635).

Regarding claim 32, Mao teaches an information distribution system comprising server equipment (programmer 24 and headend 10 – figure 1) for providing both content and non-content data (video data and webpage and information data) to subscriber equipment (set top 38, TV 40, remote control 36), the server equipment comprising:

a multiplex switch (MPEG remux 14, proxy server 22, computer 32 – figure 1) for multiplexing a plurality of formatted content data from server modules to produce an output stream that is adapted for transport to the subscriber equipment via a communication channel (MPEG remux 14 in combination with proxy server and computer 32 for multiplexing a plurality of encoded video data from VTR, camera, external network via encoder 12 and transcoder 20 to produce an output stream that is adapted for transport to set top box, television, etc. via communication channel of network 34 – figure 1; col. 6, lines 15-59);

Mao also discloses formatting HTML web pages and control map into MPEG data packets – col. 25, lines 49-62; col. 6, line 60-col. 7, line 40, figure 2. Inherently, the multiplexing comprises a converter module for formatting non-content data so that the HTML web page and control map is converted into MPEG data packet;

Mao also discloses computer 32 generates the control map, the HTML pages and the URLs for insertion into the industry standard transport layer of MPEG-2 protocol – col. 6, lines 60-64. Inherently, a switching module is used for selectively multiplexing formatted non-content data (web page, information) into the output stream so that the control map, HTML page, URL is selected/generated for insertion into the MPEG-2 protocol.

Mao further discloses a digital QAM modulator upconverter 18 coupled to the remux, computer, and a proxy server for receiving the output from the remux, computer and server (figure 1). However, Mao does not specifically disclose multiplexing of content streams is statistically performed, and wherein the multiplexing of formatted non-content data is on a future bandwidth availability basis that is predicted based on the multiplexing of the formatted content streams; a transport processor coupled to multiplexer switch for transmitting to the multiplexer switch reverse data channel information received via a reverse data channel.

Wu discloses the bandwidth allocation is assigned to Opportunistic Data Processor (ODP) for providing formatted opportunistic data **after** the bandwidth for encoded source data is calculated and available/spare bandwidth is determined. The ODP provides formatted opportunistic data for multiplexing only **after** the available/spare bandwidth is determined and bandwidth allocation for formatted opportunistic data is received. The TSPs also provide encoded source data for multiplexing **after** bandwidth allocations are assigned (col. 2, lines 13-38; col. 4, lines 38-47, col. 5, lines 10-52, col. 6, lines 17-27). Therefore, the claimed feature “multiplexing of content streams is statistically performed” is interpreted as multiplexing of opportunistic data only when total bandwidth used for encoded video streams by all the TSP drops below threshold – see including, but are not limited to, col. 4, lines 40-47; col. 5, lines 14-67; col. 6, line 17-26; col. 6, line 55-col. 46); the claimed feature “selectively multiplexing of formatted non-content data is on a future bandwidth availability basis that is predicted based on

the multiplexing of the formatted content streams” is interpreted as selectively multiplexing formatted opportunistic data into the bandwidth allocation for later multiplexing the formatted opportunistic data into the stream that is predicted/determined and then allocated for formatted opportunistic data after calculating the bandwidth for encoded source data and spare/available bandwidth.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Mao to use the teaching as taught by Wu in order to maximize bandwidth utilization and provide cost saving and minimizes disruption to the existing encoders in the field (col. 3, lines 59-61). However, Mao in view of Wu does not specifically disclose a transport processor coupled to multiplexer switch for transmitting to the multiplexer switch reverse data channel information received via a reverse data channel.

O’Loughlin discloses data transport system 12 coupled to bi-directional multiplexors 18, 24, 26 for receiving the output content from bi-directional multiplexors 18,24,26 and for transmitting to the bi-directional multiplexors 18,24,26 reverse channel information received via data transport system 14,16,multiplexors 20,22,28 (see include, but not limited to, figures 1-5, col. 6, line 52-col. 9, line 54). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Mao in view of Wu to use the teaching as taught by O’Loughlin in order that the service providers can service their customer with greater flexibility (col. 5, lines 55-61), or to improve efficiency in data transmission system.

Regarding claim 33, Mao in view of Wu teaches the system as discussed in the rejection of claim 32. Mao further teaches the multiplex switch includes a buffer (i.e. proxy 22) for storing non-content data (col. 25, lines 45-48) and a switch controller (i.e. computer 32) for insertion of control map and web pages into the industry standard transport layer of the MPEG-2 protocol (col. 6, lines 60-64). Wu also discloses buffer 162 for buffering the opportunistic data (figure 1) and a switch controller (QLP 130) for determining a bandwidth utilization level of the multiplex switch, the switch controller further for causing at least a portion of the non-content data in the buffer to be multiplexed into the output stream when the bandwidth utilization level falls below a threshold utilization bandwidth level (the QLP 130 causes the opportunistic data from buffer 162 to be multiplexed into the stream when the bandwidth utilization level drops below a threshold utilization bandwidth level – including, but are not limited to, col. 4, lines 40-47; col. 5, lines 14-67; col. 6, line 17-26; col. 6, line 55-col. 46). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Mao to use the teaching as taught by Wu in order to maximize bandwidth utilization and provide cost saving and minimizes disruption to the existing encoders in the field (col. 3, lines 59-61).

Regarding claim 34, Wu further discloses the threshold bandwidth utilization level comprises a utilization level sufficient to process a single time extent (i.e. service interval for a portion of opportunistic data). Wu further discloses digital audio and video

data or any other digital data in MPEG-2 standard – col. 4, lines 6-26, lines 37-40).

Thus, the content streams are inherently divided into a plurality of respective time extents (time interval corresponds to a portion/segment of the digital data).

Regarding claim 35, Wu further discloses the content streams contain digital data in MPEG-2 standard (col. 4, lines 6-26 and lines 37-40). Thus, the content streams are inherently divided into a plurality of respect time extents (time interval associated with each segment/portion of the MPEG-2 stream). Wu further discloses each TSP, including ODP, send statistical information tot he QLP 130, including e.g., a “need parameter” that indicates the bandwidth need of the TSP..., the QLP calculates the total bandwidth and allocates the available bandwidth to each individual TSP in proportion to the TSP’s need parameter. Each TSP sends packets to the multiplexer according to the bandwidth allocation (col. 5, line 10-col. 6, line 27). Since the need parameter and amount of bandwidth allocated to the TSP and the ODP are provided, the predetermined number of time extents (number of packets which associated with a time interval) are multiplexed into the output stream (for example, no packets of opportunistic data is multiplexed into the stream if bandwidth allocated for ODP is zero – col. 6, lines 17-26).

Regarding claim 36, Mao further teaches the non-content data comprises control data (i.e. control information in control map) and non-control data (i.e. web pages, URL), and the multiplex switch preferentially multiplexes the non-content control data (figures 1-4, 7; col. 6, lines 26-64; col. 7, lines 1-67).

Regarding claim 37, Mao further teaches the non-content data comprises control data (i.e. control information in control map) and non-control data (i.e., web page, URL), and the multiplex switch preferentially multiplexes the control data (figures 1-4, 7; col. 6, lines 26-64; col. 7, lines 1-67).

Regarding claim 38, Mao further teaches the content data includes MPEG data (col. 6, lines 25-67).

Regarding claim 39, Mao further teaches the non-content data includes Internet protocol data (HTML web page, URL, figures 1-5, col. 6, lines 26-64, col. 7, lines 1-67).

Regarding claim 40, the limitations of the method as claimed that correspond to the limitations of the system as claimed in claim 32 are analyzed as discussed with respect to the rejection of claim 32.

Regarding claim 41, Wu further teaches storing non-content data until bandwidth availability enables multiplexing of the stored non-content data (storing opportunistic data in buffer 162 until TSPs do not need all available bandwidth of the transport stream – figure 1; col. 5, lines 1-19).

Regarding claims 42-44, the limitations as claimed correspond to the limitations as claimed in claims 35, 38-39, and are analyzed as discussed with respect to the rejection of claims 35, 38-39:

**(10) Response to Argument**

**No Motivation to Combine Mao with Wu** (pages 10-13).

Appellant argues there is no motivation to combine Mao with Wu because Mao's teaching would not have suggested Wu's approach of using an opportunistic data processor (ODP) for transmitting data such as the master control map, HTML Program Association Table (HPAT), taught in Mao. Mao teaches that the three tables contained in a control map..... It would not be obvious to insert such a table in an opportunistic data stream based on bandwidth availability (page 10, paragraph 3-page 11, paragraph 3). This argument is respectfully traversed.

The examiner recognizes that obviousness/motivation can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to

combine Mao with Wu is found in the references themselves (see the Final Office Action, dated 3/16/2007, page 9). In particular, Mao discloses a system comprising server equipment (e.g. head end 10 – figure 1) for providing television program content and auxiliary data (e.g., Internet data, advertisement, or channel information, etc.). The television program content and auxiliary data are multiplexed together for providing as transport to the subscriber equipment (e.g. television, or set top box) via a communication channel. The multiplexed signal broadcasted to user television equipment using MPEG-2 (see include, but are not limited to, figures 1-2, 4-5, 8, col. 6, line 15-col. 7, line 18).

Wu also discloses a system comprising server equipment (figure 1) for providing television program content (television signal/encoded data) and auxiliary data (opportunistic data). The television program content and auxiliary data are multiplexed together for providing as transport to the receiving equipment (user equipment connected to receive MPEG-2 transport stream –figure 1) via a communication channel. The multiplexed signal provided to the receiving equipment using MPEG-2 standard (see include, but are not limited to, figure 1, col. 2, lines 7-30, col. 4, line 6-col. 5, line 19). Wu further discloses “multiplexing of content streams is statistically perform”, and “selectively multiplexing of formatted non-content data is on a future bandwidth availability basis that is predicted based on the multiplexing of the formatted content streams” (see discussion on page 5, of the Office Action, dated 11/16/2006). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Mao to use the teaching as taught by Wu in order to maximize

bandwidth utilization and provide cost saving and minimizes disruption to the existing encoders in the field (col. 3, lines 59-61).

In addition, all the claimed elements were known in the prior art as discussed in Final Office Action, and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective function (e.g., combining the teaching of "multiplexing of content streams is statistically performed, multiplexing of formatted non-content data is on a future bandwidth availability based that is predicted based on the multiplexing of the formatted content" as taught by Wu), the combination of Mao with the teaching of Wu would have yielded predictable results to one of ordinary skill in the art at the time of the invention (e.g., to maximize bandwidth utilization, to save cost, to minimize disruption to the existing encoders in the field).

Therefore, the combination of Mao with the teaching of Wu is proper.

Appellant further argues Wu does not calculate, determine, forecast, estimate, anticipate or predict what the bandwidth condition will be like in the future and multiplex data with respect to that prediction. Wu teaches that the ODP 162 "tricks" the QLP 130 into assigning it bandwidth only when the ODP 160 determines that excess (spare) bandwidth that is not being used by the TSPs is available, and if the global QL value drops below the threshold, this means there is spare bandwidth available for the opportunistic data...Thus, the combined teaching of Mao and Wu does not teach "predicting future bandwidth availability based on the statistical multiplexing of the formatted content streams; and selectively multiplexing formatted non-content data into

said output stream on a future bandwidth availability basis" as provided in Appellant's claims 32 and 40 (page 11, paragraph 4-page 13, paragraph 4). This argument is respectfully traversed.

As Appellant admitted Wu teaches that the ODP 162 "tricks" the QLP 130 into assigning it bandwidth only when the ODP 160 determines that excess (spare) bandwidth is not being used by TSPs is available, and if the global QL value drops below the threshold, this means there is spare bandwidth available for the opportunistic data (page 13, paragraph 2), Wu must calculate, determine, forecast, or predict the bandwidth condition will be like in the future and multiplex data with respect to that prediction (e.g., bandwidth available for opportunistic data and used the bandwidth available/spare for the opportunistic data). If Wu does not calculate, determine the bandwidth condition, how can it know the excess (spare) bandwidth that is not being used by the TSPs is available for opportunistic data?

Wu further discloses "multiplexing of content streams is statistically perform", and "selectively multiplexing of formatted non-content data is on a future bandwidth availability basis that is predicted based on the multiplexing of the formatted content streams" (see discussion on page 5, of the Office Action, dated 11/16/2006). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Mao to use the teaching as taught by Wu in order to maximize

bandwidth utilization and provide cost saving and minimizes disruption to the existing encoders in the field (col. 3, lines 59-61).

Mao discloses selectively multiplexing formatted non-content data (e.g., web page, information) into output stream. Wu discloses multiplexing of content streams is statistically perform" and "selectively multiplexing of formatted non-content data is on a future bandwidth availability that is predicted based on the multiplexing of formatted data streams" (please see discussion in the Final Office Action, pages 7-9, page 12, and discussion in the "Ground of Rejections" section regarding claim 32 and 40 above).

Therefore, the combination of Mao in view of Wu suggests or teaches "predicting future bandwidth availability based on the statistical multiplexing of the formatted content streams; and selectively multiplexing formatted non-content data into said output stream on a future bandwidth availability basis" as provided in Appellant's claims 32 and 40.

**Mao, Wu and O'Loughlin** (page 13-16)

Appellant argues if O'Loughlin were to be combined with Mao and Wu, one would still not have resulted in Appellant invention, as cited in either claim 32 or 40. Thus, Mao, Wu, and O'Loughlin, singly or in combination, fail to teach or suggest the invention as a whole (page 14-page 15). This argument is respectfully traversed.

Mao in view of Wu and O'Loughlin discloses all the claimed elements of claim 32 and 40 as discussed in the Final Office Action (pages 6-9) and discussed in "Ground of

Rejection" above. All claimed elements were known in the prior art (in combination of Mao, Wu, and O'Loughlin) and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention (e.g., to maximize bandwidth utilization, cost saving, to minimize disruption to the existing encoders in the field, to provide customer with greater flexibility, or to improve efficiency in data transmission system).

Therefore, the combination of Mao in view of Wu and O'Loughlin discloses method and server comprises elements as recited in claim 32 and 40.

Appellant argues Mao does not teach the claimed features of "wherein said multiplex switch preferentially multiplexes said non-control data" or "wherein "said multiplexed switch preferentially multiplexes said control data" as recited in claim 36 or claim 37, wherein "preferentially multiplex" means prioritize (page 16, paragraphs 2-3). This argument is respectfully traversed.

"preferentially multiplex means prioritize" is not recited in the claims. The Examiner interprets the claim element "multiplex switch preferentially multiplexes said non-control data" as remux, proxy server, computer server, multiplexes web page, URL, etc. (see include, but are not limited to, figures 1-4, 7, col. 6, lines 26-64, col. 7, lines 1-67) or "multiplexed switch preferentially multiplexes said control data" as remux, proxy server,

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computer server, multiplexes control data such as control information in control map  
(see include, but are not limited to, figures 1-4, 7; col. 6, lines 26-64, col. 7, lines 1-67).

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the  
Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



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